



May/June Examination Period 2023-24

ECN106 Macroeconomics 1

Duration: 2 hours

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Answer ALL questions

Non-programmable calculators are permitted in this examination. Please state on your answer book the name and type of machine used. Complete all rough workings in the answer book and cross through any work that is not to be assessed.

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Examiner: Miguel H. Ferreira

Section A

Consider the outcome of an economy in the **long-run** with $N = 7000$ potential workers who may be employed or unemployed. Suppose that the aggregate production function is

$$Y = A\bar{K} \cdot L^\alpha = AL^\alpha,$$

where Y is real GDP, L is the number of employed people and A aggregate productivity. Assume that $\bar{K} = 1$, the initial productivity level is $A = 1$

Further suppose that the job separation rate is $s = 0.07$ and the job finding rate is $f = 0.9$. Recall the firm's marginal product of labour (MPL) is given by

$$MPL = \alpha \frac{A}{L^{1-\alpha}}$$

where α is the share of labour in the economy and equal to 0.6.

On the demand-side, suppose that the consumption and investment functions are, respectively,

$$C = \bar{C} + c(Y - \bar{T}) = 40 + 0.6(Y - \bar{T})$$

$$I = \bar{I} + i(r) = 180 - 1200r.$$

where r is the real interest rate. Assume government purchases are $\bar{G} = 100$, and taxes are $\bar{T} = 140$.

Finally, suppose that monetary base is $B = 1000$, that reserve ratio is $rr = 0.08$ and the currency deposit ratio is $cr = 0.6$.

To summarize,

$$\begin{aligned} N = 7000, \quad s = 0.07, \quad \bar{G} = 100, \quad B = 1000, \\ f = 0.9, \quad \bar{T} = 140, \quad rr = 0.08, \quad cr = 0.6 \end{aligned}$$

Answer all questions on the following page. Always assume that the economy is in equilibrium (in all markets).

Question 1: Calculate the long-run equilibrium. For this, you need to find the equilibrium values of Y , W/P , C , S , r and I .

[16 marks]

Question 2: There is an increase in aggregate productivity A to 2.

a What is the new long-run equilibrium values of Y , W/P , C , S , r and I .

[6 marks]

b Explain graphically the adjustment in the goods and financial markets.

[8 marks]

Question 3: The short-run equilibrium is initially at the long run level you found in Question 1, with $A = 1$. Assume the Central Bank Taylor rule is as follows

$$R = \bar{r} + m_Y(Y - \bar{Y}) = \bar{r} + 6(Y - \bar{Y})$$

Inflation expectations are $\pi^e = 0.02$. The government decides to increase spending from 100 to 110. Assume $\bar{Y} = 193.88$ and $\bar{r} = 13.2\%$.

a Find the short-run equilibrium values for Y , C , I , r and i following the government spending shock.

[10 marks]

b Explain graphically the adjustment using the Keynesian cross and the IS-MP model.

[8 marks]

c Why is the change in output smaller than the one implied by the Keynesian multiplier?

[7 marks]

d Using graphical analysis, discuss how your previous answer would change in case:

1 $m_Y = 0$

[5 marks]

2 $c = 0$

[5 marks]

e Using the AS-AD model, explain intuitively and graphically the transition from the short run to the long run equilibrium, assuming there is no response from the monetary authority to output deviations from its target value and that $\bar{r}$ adjusts on impact with the shock.

[10 marks]

Turn Over

Section B

Multiple choice questions: There is always at least one correct answer but there may be more than one correct answer. Select all answers that are correct. Justify your choice of answer(s) in 1 or 2 lines.

Question 4: Which of the following are true about the Keynesian multiplier? There may be more than one correct answer.

- a. It is affected by the marginal propensity to consume (MPC).
- b. It is affected by government spending.
- c. It is affected by taxes.
- d. It is affected by the real interest rate.

[5 marks]

Question 5: Which of the following are true about the nominal interest rate i ? There may be more than one correct answer.

- a. In the long-run it is determined by the Central Bank.
- b. In the short-run, an increase in savings leads to a lower i .
- c. All else constant, an increase in inflation expectations increases the nominal interest rate according to the Fisher equation.
- d. In the short-run, an increase in the real interest rate leads to a higher i .

[5 marks]

Question 6: Which one is true about short run equilibrium output Y ? There may be more than one correct answer.

- a. Fluctuates with planned expenditure.
- b. Y is determined by the labour market equilibrium.
- c. The Central Bank can affect Y by decreasing the real interest rate r .
- d. A decrease in the job separation rate leads to an increase in Y .

[5 marks]

Question 7: There are two firms in the economy. Firm A sells all its goods to Firm B, which uses these goods for the production of its final good, which is then sold to the final consumer. Which of the following are true about GDP in this economy? There may be more than one correct answer

- a. GDP equals the sum of productions of Firms A and B.
- b. GDP equals the sum of the value added of Firms A and B.
- c. GDP equals the value of production of Firm A.
- d. GDP equals the value of production of Firm B.

[5 marks]

Question 8: Which of the following is true about the MP curve? There may be more than one correct answer.

- a. Describes how changes in r affect Y .
- b. Describes the relation between nominal and real interest rates.
- c. Describes how the Central Bank reacts to deviations from the output target.
- d. Describes how the Central Bank reacts to deviations from the inflation target.

[5 marks]

End of Paper